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## THE RELATIONS OF MIND AND MATTER.

BY CHARLES MORRIS.

*(Continued from p. 953, October number.)*

## VI. THE MENTAL ORGANISM.

WE have now to consider a question of very great importance, that of the relations of the mind and its energies to the universe of matter and energy without. A review of the conditions of mental energy leads to conclusions of much significance. These, however, can only be given very briefly, but we will endeavor to point out their leading features and show the direction in which they tend and the remote possibilities of mental development which they indicate.

In the lowest animals, in which psychical powers are yet very feebly developed, if they exist at all, the inflowing energy makes its way at once to the muscular or contractile regions, and motion takes place in response. The action of external nature upon the body is immediately followed by a reaction of the body upon external nature. Where this action and reaction are in harmony, the body is a well-adapted reflex organism. As already said, however, with every new condition in the action the reaction becomes general, and new special adaptation is only slowly gained. And where there exists the rudiment of a psychical organism every sensory action of a new character probably always disturbs its conditions, yields a conscious sensation and affects its motor relations. By a long continuance of this process the mental organism becomes greatly developed. Of the external energies which crowd into the body during this increase in sensory and mental powers a constantly smaller percentage goes directly to the muscles, and a larger percentage to the mind, into which they enter as organizing or otherwise affecting agencies. Thus the energies which are checked in their flow through the body are never lost, but are employed in building up a reservoir of energies within. Instead of producing an immediate and direct reaction upon outer nature, they now produce a retarded and indirect reaction. The condition of affairs is vitally changed by this new condition of the organism. The body is at first an instrument of external nature alone. It is set in motion by the energies of certain external substances, and exerts energy on other external substances. But in its advanced condition the force of the external

energies is mainly exerted upon a fixed region of the organism, in which they become definitely centered and organized. And this reservoir of energies in its turn reacts upon outer nature. Instead of a single agent of action, with the body for its instrument, we have now two agents, an internal and an external one, with the body for their instrument. The nervous organism serves as the channel of intercommunication between these two active agents. And the high-atomed chemical molecules of the nerve cells or terminations, whether those of the outer surface, the muscles or the cerebrum, serve as sources of intermediate energy, which add to the vigor of the slight motor impulses from without or from within. In this view the mind is as little a necessary constituent part of the body as is outer nature. The body can perform its ordinary duties without the mind or its organ, and needs it only for its extraordinary duties.

In its primary relation this new condition of the organism only acts as a check on the rapidity of motor reaction. The mental affections retain their original form, and their reaction, when it takes place, will be of the same character as the immediate reaction would have been. But the mental organism soon begins to act as an independent agent. From the conditions impressed on it, new conditions are produced. There is an internal reaction and new combination of the mental energies. Memories combine to form thoughts or ideas, and motor relations are gained within the mind which have no counterpart without. These, in their turn, react on outer nature and yield peculiar results, no longer in consonance with external conditions. The microcosm without has built up a microcosm within, with powers and conditions of its own, and the body now becomes the intermedium between two independent and dissimilar acting agents. These may act only within themselves, or they may act upon each other through the medium of the body, each producing special modifications in the condition of the other.

These general considerations lead to more special ones. What is the character of the impressions produced by external energy upon the mental organism? These external energies are yielded by the substances of external nature, and in some way represent the conditions of these substances. As such they enter the body and impress the mind. Though all sensations may be conveyed over the nerve fibers as vibratory impulses, yet there must be some

difference in the character of these vibrations with every new kind of sensation, since the mind receives a peculiar impression from every peculiar sensory impulse. The memories thus implanted in the mind represent to us the conditions which exist without us. This representation very possibly may not be an exact one. Possibly it is only analogically similar. But it is all we know of external nature, and although each impression may not truly reproduce the condition from which it arose, there can be no doubt that the relations between these impressions are correct. The picture must be correct as an analogical reproduction if not as an actual one. It must be borne in mind also that the impressions received indicate the motor conditions of external substances, and that they become motor conditions of the psychical substance, so that their exactness of representation may be much closer than is usually surmised.

The mental organism thus acts as a mirror, in which the universe becomes more or less fully reflected. Its memories are reproductions, more or less exact, of external conditions, and it exists as, in a partial measure, a counterpart of external nature. But it is much more than this. Its powers are not confined to the reception and storage of external energy and the reflective reproduction of the forms and forces which emitted these energies, but it has a reorganizing power of its own. Its energies combine and produce new conditions, which may or may not have a counterpart in external nature. If these new productions are the outcome of reason they may represent conditions or forces in nature which are not apparent to our senses, as, for instance, the attraction of gravitation, or the vibrations of heat and light. If they are the outcome of imagination they may represent conditions which do not exist in nature and which are new creations of the mind.

The vision of a cathedral, for example, gives us a mental impression which becomes persistent. The mind has henceforth among its stores the image or representation of the external compound of matter which we call cathedral. A picture or a description of a cathedral may produce the same image. Close observation gives minute knowledge of the constituent parts of this edifice, and reasoning yields what the senses cannot convey, a conception of the architectural principles involved and of the forces at work in binding the parts of this structure together

down to its very chemical atoms. Thus by sensation and reasoning the mind gains a very minute and complete image of the edifice, which it may review in part or in the whole, as it will. The building seems to be erected in the mind, by the ease with which it can be mentally taken apart and put together, and each of its parts called up as a separate and distinct image.

But the mental powers can go much further than this. They can make different combinations of the separate parts of such an edifice and work out different results of the principles of architecture, and thus produce a compound not existent in external nature. This is the work of the imaginative or constructive faculty. In both these cases we seem to have but varied combinations of the mental images or energies. But the new form of building thus mentally constructed need not be confined to the mind. It can be erected in outer nature by the aid of the hands, or of other minds and hands. Thus as the mind mirrors external nature, the external may be made to mirror the mind. After beholding the cathedral there exists an image in the mind corresponding to a condition of external nature. After erecting the new edifice there exists a form in external nature corresponding to an image or condition of the mind. Mind and nature act and react upon, and each molds and modifies the other. The illustration here given might be endlessly paralleled, since it represents the general character of all the mental operations.

Evidently, then, the process of development is two-fold. The mind is being developed under influences derived from without, and the outer world under influences derived from within the body. The mind and the universe are becoming counterparts of each other, the one in external matter, the other in that unknown substance which is the basis of mind. Thus every mind is becoming a partial counterpart of the universe. At first this mirroring of the universe is very slight and imperfect. The mirror is of minute surface and very clouded in texture. But with the growth of knowledge it widens and grows clearer, and a continually greater breadth of the universe is reflected within it. If developed to its utmost conceivable extent, it might take in the whole universe and constitute a reproduction, in its special and localized conditions, of all the conditions existing in the broad range of external nature. Like the monads of Leibnitz, each of which was conceived to mirror all others, and each from its own special

point of view, each mind might come to mirror all things, physical or mental, and each from its own special point of reflection. Such a duplication of the conditions of the universe would be the necessary result of the infinite expansion of the relations of the mind of man to external nature.

The mode in which the thought constituents of the mind present themselves to consciousness strongly point to the above conclusion. We seem to become conscious of the existence of a counterpart, within our minds, of the universe, so far as we have come into rapport with it. There lie the forms surrounding us, the trees, houses, plains, mountains, &c., down to their smallest details, and each in its appropriate relation, alike of force and of position, to the others. With extended knowledge we gain a mental picture of the whole earth, with its diversity of natural scenery, its continents and oceans, its empires, cities and inhabitants, human and brute. The geological conditions of its surface are similarly apparent to us, and the deeper regions, so far as we are aware of their conditions. The intermotions and connecting forces and principles of these objects also form part of the mental reproduction. None of us have ever seen the whole of this picture. It has been mainly conveyed to our minds as a reflection from images present to other minds. Yet if we wish to see the earth we have but to look into the depths of our minds, and there we behold it, with all its parts arranged in their due order and relation. The mental universe of man is far more extensive than this. It stretches downward to include the minutest forms. We can even perceive the excessively minute atoms going through their endless dance, and the vibrations of the ether as radiations of light and heat run swiftly through it. It stretches upward to include the mightiest forms, the revolving planets and shining suns, each with its peculiar motions and attractive vigor. To see all this we do not need to look around us. We have but to look into our minds, into which it has entered and organized itself. The whole or a part may be seen at will, often falsely perhaps, from imperfect conceptions, but there lies our visible universe as it appears to our eyes, has arisen through the exercise of our reason, or has come to us at second hand from the eyes and minds of others.

We may, for instance, call up the memory of a tree. If we compare this image with the visual image of an actual tree there

will be no apparent difference, except in the greater vividness and sharpness of the latter. And it is remarkable how new impressions of an object annex themselves to those previously received, and thus fill out the original image. Our first idea of the human body is a mere outline. To this are gradually added impressions of its distinctive surface parts, its internal organs, its tissues, circulation, &c., its motions, and its general principles of formation and physiological functions. Each of these falls into its proper relation with the others, building up a full ideal image of the body. But this image retains the character of a manikin. It can be taken apart at will, and each part considered separately from the rest. This essential peculiarity pertains to all ideal conceptions. They have none of the necessary coherence of natural organisms. The conception never becomes an indissoluble mental image. It may be anatomized, as the body may, but without need of the slow process of dissection.

As to the part taken by the different senses in building up this mental picture there are important distinctions. Some yield us impressions of form and some of quality. The senses of smell, taste and hearing simply advise us of certain qualities or conditions of external things. Touch and sight also yield impressions of quality, but of form as well. They acquaint us with the space extension of objects, and also with their space relations and motions. It appears strange how the mind can gain a permanent record of the motions of one body in relation to others. We can only comprehend it as a record of form relations with time extension, the sensory impression of a very rapidly succeeding series of pictures on the mind, in each of which the relation of position of objects is changed. On recalling to consciousness this series of pictures the idea of movement must arise with it, precisely as occurs in the optical toy where a series of gradually differing pictures are blended by rapid succession on a moving disk, and the figures made to appear as if in actual motion. The impression of a musical air on the mind is probably of analogous character to the above, a time succession of differing sensations.

The reason has much to do with the correctness of our impressions of form. The eye receives its picture as a flat one, and it must affect the mind as such. The blind restored to sight see landscapes as flat pictures. Touch is necessary to make sure of the solidity of objects. Yet the pictures on the retina of the eye

differ from those on canvas in the perfection of their perspective and of their arrangement of light and shade. The effect on the mind may be that which any picture that was absolutely perfect in these respects would produce on the eye.

If we continue to view the mind as a substantial organism, and its conditions as due to the motor relations of the parts of this organism, the mode of impression of a formal image on it may bear some relation to photography.

It may seem inexplicable that the same nerve fiber in conveying currents of energy can yield such different impressions as these currents vary in their source. It might be argued that such currents could only differ in degree and not in kind. And yet the eye receives its pictures from currents of energy conveyed through a single medium, that of the vibrating ether. The variations in light and shade, color, &c., are due to variations in the conditions of this energy, and similar variations may exist in the nerve current. As an object photographs itself, through the effects of these variations in the energy of light, on a sensitive tablet, so the retinal picture of such an object, through similar variations in the energy of the nerve current, may produce an analogous effect on the sensitive mental tablet.

The idea of photography, of course, is offered but as an illustration of a sensitiveness of inorganic substance which imitates, though remotely, that of the mind. In the instantaneous photography of recent years plates are made of such exquisite sensitiveness as to take a good picture in a very minute fraction of a second. While these plates are kept from the light no change is produced in them. The instant the light falls upon them an exact surface copy of the object from which it emanates is produced on the sensitive plate. And this picture becomes a permanent condition of the plate. Some change has been produced in its motor or chemical organization, and the picture remains an indissoluble characteristic of its subsequent organization.<sup>1</sup> The parallel this presents to the mind, viewed as a sensi-

<sup>1</sup>In illustration of the sensitiveness of material surfaces we may quote from Professor Draper: "If on a cold polished piece of metal any object, as a wafer, is laid, and the metal then be breathed upon, and when the moisture has had time to disappear the wafer be thrown off, now upon the polished surface the most critical inspection can discover no trace of any form. If we breathe upon it a spectral figure of the wafer comes into view, and this may be done again and again. Nay, even more, if the polished metal be carefully put aside, and be so kept for many months



tive organism, is strikingly complete. We may, as an analogy, view this organism as having a delicately sensitive surface, which remains unaffected while it is kept from the influence of the nerve current, like the photographic plate when kept from the light. But the instant the energy of this current touches it a pictured image is produced which closely represents the object which instigated the nerve current. And this picture becomes a permanent condition of the mind. It indicates a fixed change in its motor organization. In this respect, however, the mind represents a photographic plate of extraordinary sensitiveness, one in which we might imagine that each picture sinks below the surface, or a new sensitive surface is immediately formed over it.

We may pursue this analogy of the organism of the mind to conceivable photographic conditions somewhat further, and reach other interesting conclusions. In this connection the relations which our mental impressions bear to each other form an important subject of inquiry. These relations are of two kinds, one of similarity, either direct or analogous, and the other of contiguity in time of reception. Each new impression seems to connect itself with all preceding similar impressions in such a manner that consciousness of the one tends to recall the other to consciousness, this effect being the more marked the greater the resemblance. As intimate a relation exists between impressions received together, although they may be very unlike. Their connection in time serves as a link of combination. They elbow each other in the mind, as it were,

These are the two distinguishing features of remembrance, and seem to point to two distinct conditions under which the mind retains its images. In regard to contiguity in time the recall of a mental image seems to recall the whole surface condition of the

(I have witnessed it even after a year), on breathing again upon it the shadowy form emerges. Or if a sheet of paper, on which a key or other object is laid, be carried for a few moments into the sunshine and then instantaneously viewed in the dark, the key being simultaneously removed, a fading spectre of the key on the paper will be seen; and if the paper be put away where nothing can disturb it, and so kept for many months, at the end thereof, if it be carried into a dark place and laid upon a piece of hot metal, the spectre of the key will come forth. In the case of bodies more highly phosphorescent than paper, the spectres of many different objects, which may have been in succession laid originally thereupon, will, upon warming, emerge in their proper order. Indeed, I believe that a shadow never falls upon a wall without leaving thereupon its permanent trace—a trace which might be made visible by resort to proper measures" (*Physiology*, p. 288).

mind as it existed at the time of reception of that image. It is as if, as above said, the mental organism at each period presented a clear surface for the photographing of impressions, which was immediately covered by a new-formed surface. In this view the mind seems to present itself as an unlimited series of overlapping laminae, on each of which is photographed the thoughts and events of one period of life, while the touching of any special lamina by consciousness calls up to the mental vision all the contiguous impressions on that lamina. And the fixed hereditary constitution of the mind may be a deep-laid foundation, overlaid by these succeeding formations and far beneath the reach of consciousness, yet exercising a vigorous influence over the later developmental processes of the organism. Another point necessary to mention is that physical impressions and mental conceptions appear to affect the mind in the same manner, so that it becomes sometimes difficult to distinguish between a sensation, a memory or an idea. In states of hallucination no line of demarcation remains, and at any time the principal distinction seems that of vividness. The mind apparently retains its images in but a single mode.

The relation of similarity adds another structural feature to this conception of the mind. If we see a fine view to-day it may call up to our mental vision a somewhat similar one seen ten or twenty years ago. We have reason to believe that identical impressions flow together and strengthen their resultant, until the mind may very feebly respond to an incessant repetition of the same image. The motor conditions of the mind are so in harmony with the sensation that it produces a hardly appreciable disturbance. This would indicate that identical impressions affect a fixed locality in the mental organism, and the same may be the case, in a less exact degree, with all similar impressions. In such a case the relation would not be one of surface contiguity, but of vertical contiguity, the localized impression being in close relation of position to all similar ones lying below it in the depths of the organism. All this, of course, is pure hypothesis, yet it is of interest in connection with the phenomena of the association of ideas, if we consider the mental conditions to be the organizing relations of a substantial organism. Yet one further resultant of this analogical conception of the mind may not be amiss. The sinking of an impression below the sensitive surface of the mind

might have some relation to the frequent difficulty of recalling an old memory, and the general disappearance of memories from the grasp of consciousness, until recalled by some association. For consciousness may be looked upon as a superficial affection of the mental organism, aroused only when this surface is acted upon by cerebral energy. But present sensations might be able to connect themselves with old memories in the manner just described. And in so doing they might rouse a whole sheet of memories, spread over some deep mental lamina. The energy which produces a surface consciousness, through rapport between the mind and the cerebrum, might through this rapport of the mental laminæ make its way to deeper regions, and awake long dormant impressions of the mind.

The hypothetical idea of the constitution and development of the mental organism just given, while perhaps very remotely analogous to the reality, yet answers to the conditions of sensory reception and memory with sufficient exactness to be worthy of a clearer delineation. In this view, then, each man derives hereditarily a firmly-constituted germ of the mental organism, destitute of ancestral experiences, yet, like every part of the body, possessed of its innate habits, capable of exercising more or less control over all subsequent mental activities, and also limiting by its conditions the degree and direction of the subsequent development. This is the hereditary mind, the granite rock basis of its future formation. It has no power in itself to develop beyond this. All the other organs of the body may fully unfold from their innate forces while the mind remains in the germ. Its development is a purely individual process, and the results are not transmissible to offspring.

Still considering it as a substantial organism we seem to behold layer after layer of new substance laid down upon it, as strata are laid upon the granite basis of the geologic formation, and taking form from the form of this basic organism. Each of these lamina is delicately sensitive to the impress of external energy, and becomes covered with a series of pictured images, the fossils of the memory. With the formation of each new lamina all preceding ones are buried below the immediate contact of energy and the direct reach of consciousness. But as the impressed images on each lamina are in horizontal contact with each other, so each new impress seems to be drawn to a locality of the organism which

has been the seat of similar impressions. It is as if, in seeking entrance to the mind, it found its easiest channel at the point where impressions of some degree of similarity had already entered. Thus impressions of similar character become vertically in contact or in close contiguity.

This idea certainly offers some explanation of the phenomena of recollection, or the recall of memories. Consciousness is a resultant of the immediate relations of the cerebrum with the surface conditions of the mental organism. It has little or no penetrative power in itself. To receive an impression on a fixed mental locality does not of itself cause disturbance of the impressions which may lie below that locality. But when an impression is added to a vertical series of similar impressions, consciousness seems to make its way downward and to arouse the whole or any specially harmonious part of the series. And on thus reaching any mental lamina it may spread itself widely over that lamina and arouse to our attention a broad sheet of its impressions. Such seems the character of conscious association. No memory is recalled except through direct or indirect links of association with some present phase of surface activity. And no memory remote in time reappears until consciousness first establishes a rapport between some present impress or idea and a somewhat similar one received at that period of time.

The conditions thus impressed on the mental organism from without never remain separate conceptions, like the successive pictures in an album. They combine with each other and establish relations resembling those that exist between the originals. All we perceive are forms, qualities or conditions, and motions. Any deeper knowledge of nature must be attained through the innate operations of the mind. The received motor conditions do not lie passive in the mind, but spread under the influence of consciousness, or the energy which consciousness represents. They gradually exercise their native affinities and establish connections and relations similar to those which they possessed externally. The forces and principles which exist between external forms and conditions become evident between their mental counterparts as memories combine into ideas, and these forces and principles become in their turn objects of conscious conception. The universe tends to repeat itself fully in the mind.

But mental activity does not stop here. Forms and forces also

enter into relations which might possibly exist in outer nature, but which have never existed. Thus the mind erects an ideal world of its own, which it has the power partly to reproduce externally. This power of ideal formation is practically unlimited. The world within to some extent cuts loose from the world without, grows beyond immediate dependence upon it, reproduces the possible as well as the actual, becomes a self-centered and specialized compound of energies, and reacts as a modifying agent on that external world which has so long and so powerfully acted upon it.

As already said, the mind as a developed organism is not, like the remainder of the body structure, transmitted to offspring as a constituent feature of the germ. It must grow up in each individual anew. The most fully developed cerebrum has no power in itself to unfold the mind beyond its embryo stage, the seed of psychic existence which is derived from a long line of ancestors. The fundamental psychic conditions of our ancestors persist in our minds, not as experiences, but as strongly influencing tendencies. We cannot relegate these innate tendencies to any personal experiences, but they have the force of a large body of experiences. They form the fundamental state of our mental organism, over which are laid all its more individual states. They are a collocation of tendencies, inclinations, attributes, emotional strains, &c., which compose the original stuff of the psychic germ, the framework upon which all its later material is molded. From this original strain and the variations produced in it by subsequent experiences, proceeds our mental character, which is thus a combination of heredity and experience. Our own course of thought adds nothing to it, but the shades of change in mental character which are produced during our life may be transmitted to our offspring, and thus evolution take place in the hereditary basis of mind. This mental character forms our great moving power. It may occasionally be overcome by vigorously concentrated thoughts, yet it exercises a control over the action of nearly all our mental motive powers, and forms the great restraining agent of the mind, the concentrated wisdom of a thousand generations. But for it our actions might be very erratic, without a rudder to guide the movements of our headstrong and vagrant thoughts.

Judgment is not a passive, but an active quality. It is the name we give to the concentrated vigor of all the thoughts active

in our mind in its calm state, and the sublimate of ancient thought that forms its hereditary strain. The actions we perform, the resolutions we take, are greatly subordinated to this compound of influences. They exert a force which we call will. In emotional states, on the contrary, when a few thoughts, or a single thought, perhaps, are abnormally active and the general sum of thoughts driven deep into unconsciousness, the will is differently conditioned. Vigorous and often abnormal action takes place in response to these active mental energies, and in spite of a dull protest from the nearly banished judgment. The active thought takes the bit between its teeth and runs away with us. The indications are that each conscious thought becomes an agent of control in accordance with its degree of activity, that the force resultant of all the thought activities present to consciousness at any one period constitutes the will-power, and that the action of this will be normal or abnormal in accordance with the diversity or the narrowness of the agencies active in it.

As for the control of the body by the mind, it seems almost as if the latter possessed an exact transcript of the muscular apparatus of the former. Desire to move a certain limb is accompanied by thought of that limb. Does a representation of the desired motion take place in the mind ere action is exerted on the motor nerves? Is there conscious excitation of a region of the mind which is in direct cerebral connection with the limb? We do not think of the muscles, but of the limb to be moved. As the mind contains a conscious transcript of external nature, does it also contain a complete transcript of the body, and does its self-performance of the action desired, upon its image of the physical frame, call into activity that region of the mental organism which communicates with the desired muscle? If every portion of the body is in direct connection with a fixed portion of the cerebrum, as is probably the case, then each portion of the mental organism may possess a similar connection, and to think of a limb is to rouse that part of this organism which is in immediate motor connection with the muscles governing that limb. Much of this connection must be hereditary, and its action a mentally reflex activity. But control of the body by the mind is in considerable part acquired. It seems almost as if the mind sought out the body, and only gradually completed its picture of it, or brought itself into complete motor relations with it.

The usually entertained idea that our mental picture of nature is only analogically correct, which has by some writers been carried to such an extreme as to deny that the external world exists at all, but that the mind and its images constitute the universe, calls for some attention here. The extreme view may be at once dismissed as not consistent with what we know of the laws of energy, which forbids evolutionary changes in a concrete organism except under the influence of energies received from without. And a strong argument may be brought in favor of the view that our conceptions of the external are not illusory, but that the image received by the mind is a close reproduction of the conditions actually existing in external nature.

Bodies are composed of matter, but it is matter molded by force and energy, and all form and quality are due to the inter-relations of this energy. Color is due to a special action which is exerted upon the waves of light; sound to an action upon the molecules of the air. Colors and sounds, therefore, while not belonging to the body which seems to emit them, indicate special conditions or qualities of that body. By the study of these special emissions of energy we arrive at deeper conceptions of the true character of the body. Our first conception of any object is very crude and inexact. Exactitude can only be gained by a close scientific study of all these special characteristics and influences of the object. Our senses do not advise us of the real character of matter, but only of its combinations and their properties. Nor are we aware of absolute, but only of relative conditions. Our body, with its conditions, is the standard by which the universe is ordinarily measured. If our body was colder what we now call cold would become warmth. If it was firmer hardness would become softness. If it was larger largeness would become smallness. But science is rapidly ceasing to make the body the test of nature, and has made some steps from the relative towards the absolute. It declares that a certain temperature arises from a certain vigor of vibration, a certain color from a fixed rapidity of vibration, that degrees of hardness arise from fixed degrees of resistance in bodies, &c. It is true that these results are expressed in terms of space and time, and space and time extension must remain to us relative conceptions. Yet nothing else need be relative. If the apparent dimensions of objects are truly related to our conception of space and the dura-

tion of events to our conception of time, they are true to this extent, and within this limitation we may arrive at correct conceptions of existence.

Objects emit energies. These energies are external expressions of the conditions of the object emitting them. So they are acted upon by energies which they partly repel, and which are modified by their momentary connection with the object. On the other hand the energies which penetrate the object from outside act to modify its conditions. In other words, all energies exert a power of leverage. The energies emitted by any object on flowing into another forcibly impress some of their peculiar characteristics upon it. The receiving body is brought into a certain conformity of condition with the emitting body. This leverage is in constant operation, and every body is seeking to change every other body within the range of its influence into an image of itself. These emitted energies vary. Some are general, like those of heat. Others are characteristic. The degree of leverage exerted depends upon the degree of special modification in the emitted energies. Through this assimilating influence, and the counter influence of opposing energies, and of innate forces, bodies are organized.

But the influence produced by this leverage depends upon the mobility of the body acted upon. Some are rigidly centralized and vigorously resist change. Others readily yield. Some are peculiarly mobile, and may vary in condition under every impress of special energy from without, assuming some degree of similarity to the emitting bodies. In this mobility, or sensitiveness, the mental organism impresses us as far beyond any other condition of substance in nature, and therefore as peculiarly adapted to respond and vary into conditions of organization in conformity with those of the bodies acting upon it. And its power of retaining these impressions is so excessive that it is capable of receiving them in countless numbers, with little or no obliteration of those formerly received.

But this conception of the leverage of energies upon the mind and its faint resistance, leads directly to the conclusion that the mental organism is becoming, in an exact sense, a reproduced copy of external nature. The conditions of all bodies are merely arrangements of matter under the influence of innate energies. The energy is the essential constituent of condition, the matter only its inessential basis. Any substance which accepts these



modes of energy necessarily assumes similar conditions. The combination of energy without produces an equivalent combination of energy within, and the mind takes on characteristics of organization resembling those of the bodies acting upon it, precisely as the photographic plate may be said to assume surface characteristics resembling those of the bodies to whose emitted energies it has been exposed.

And this modifying influence is not exerted solely during the life of the individual, but is also an element in the hereditary conditions of the organism. It has been exerted throughout the whole phylogenetic development of the individual. The leverage of external energy is not exerted upon each mind separately to the production of changes in an original rigid substratum, but this substratum itself has been organized under the influence of such energies, from its origin in the earliest germ of psychical existence, becoming steadily more complex under the incessant play upon it of the energies of the universe. It seems to follow as a necessary consequence that our conceptions of nature must represent actual conditions, and that the whole mental organism, down to its inmost center, has been molded by external nature, and is an exact reproduction of nature to the extent that it has come into contact with it.

But this only represents the mental conditions in part. The mind has some directive control of its own forces. These interact, combination of mental conditions takes place, and results arise which have no counterpart in external nature. These, in their turn, exert a leverage on external substance, and forms are produced which exactly represent the ideal products of the mind. The mind molds nature into its own image.<sup>1</sup> This mental com-

<sup>1</sup> The molding influence of the mind upon outer nature, through the reproduction in matter of its ideal images, has a parallel in the influence exerted by the mind upon the body. We are all aware how the facial expression comes to indicate the character of the mind, and varies in accordance with mental variations. The mind has also a remarkable leverage upon the body in the cure or the production of diseases. Disease has frequently been cured by remedies which could not possibly have had any influence, simply through mental faith in their efficacy, and death has followed a mental image of mortal injury, as in the celebrated case of the fictitious bleeding of a French criminal. Very marked instances are those of the appearance of the stigmata, or the wounds of the crucifixion, in the case of St. Francis d'Assisi, and several later zealots, apparently through long mental dwelling upon the idea of the crucifixion. The credibility of these is accepted as probable by good authorities, and the ulcerous effect ascribed to mental influence on the capillary circulation through the vaso-motor centers. See "Influence of the mind upon the body in health and disease," by D. H. Luke, M. D.

bination of energies is a process which has its analogue in the outer world. Similar combinations take place in objects, and the energies received from without combine with those within to produce new conditions. If the mind has a substantial basis it must conform, in every respect, to the principles which display themselves in external compounds of substance. Yet in this respect the mind seems to be peculiarly active. The objects of the outer world consist of a dense aggregate of matter affected by a limited volume of energy. As all change is due to the interaction of this energy, external objects vary but slowly and slightly, sluggishly resisting its action. In the case of the mind we may conceive its substance to be reduced to a minimum and its energy enhanced to a maximum. Thus its mobility is extreme, its sensitiveness excessive, its interactions of energy rapid and incessant. Its powers of change and of new formation of conditions are vast as compared with those of physical objects.

And the molding of the mind of man by nature is but slightly due to its direct sensations from external objects. It is very largely produced through the medium of other minds, since a leverage exists between mind and mind as between mind and matter in producing conformity of conditions. In this indirect way a single mind may have been brought into conformity with outer nature through the intermediate influence of millions of other minds, exercised through the preservation of their ideas in books, or through their effects upon human society.

We may close here with a brief consideration of the status of the human mind if its development could be continued to infinity. In such a case it would necessarily become an infinitely complete reproduction or representation of the universe, and infinitely sensitive and mobile to any modifications taking place in the vast domain of space. In the second place, it would be infinitely capable of producing within itself new combinations of energy. It would thus be far more than an image of the universe, since to this it would add a second universe of self-formed ideas. In the third place, it would be infinitely capable of reproducing these ideas in outer nature, and thus bringing the universe into conformity with itself. Man's powers in this respect are limited, yet without changing place he has, by availing himself of the motor principles and physical conditions of nature, a very extended reach. As one example, by making the telegraph wire a virtual

extension of his body, he may exert a physical influence many thousand miles away. An infinite mind might possess infinite command of these conditions and principles, and produce effects reaching to the limits of the universe. Fourthly, consciousness would become extraordinarily developed in such a mind, and its whole vast range of memories be present at will. Prevision would have a like extraordinary development. In short, in such a mind all that we include in the name Deity would exist. It would not be the deity of pantheism, the soul of the world, any more than man's mind is the soul of the machine he has devised, and whose motion he controls. The energies of nature would exist separately from those of the deific mind, but they would be mirrored in this mind, and would be infinitely and endlessly subject to its control.

That any developing mind could reach infinity of development is, of course, impossible. If such a being as the one here considered exists, it must be as a co-eternal existence with the universe, a primordial equivalent in conscious of the physical universe in unconscious conditions. Yet consciousness and varying activity could not exist, even in such a deific mind, except through the impulse of energy received from without. Between such a mind and the universe there must be an incessant interchange of energies, with consequent modifications in the condition of each. But the mobility of mental, as compared with the sluggishness of inorganic change, must necessarily make the former the ruling agent. Once in harmonious agreement with external conditions, it would subsequently, by its rapidity of ideal combination or construction, impose constant new conditions upon external nature, and become the sole active moving force in evolution, thinking out the universe, as it were, and embodying all its thoughts in substance. This idea is offered as a curious speculation only, a corollary from the view of the mental constitution above taken, and as a hypothetical contribution to the somewhat extended list of theistical theories extant.

*(To be continued.)*